REMARKS

Claims 1-38 are pending. By this Amendment, claims 35-38 are added. No new matter is added.

Support for the new claims 35-38 is found, for example, in paragraph [0025] and FIGS. 5A-5D of the Applicants' disclosure. Applicants gratefully acknowledge the indication on page 3 of the Office Action that claims 17-20, 23-26, 29, 30, 33, and 34 are allowed, and claims 4-6 and 11-13 recite allowable subject matter.

For the following reasons, Applicants' request reconsideration.

REJECTIONS UNDER 35 U.S.C. §102:

Claims 1-3, 7-10, 14-16, 21, 22, 27, 28, 31 and 32 are rejected under 35 U.S.C. §102(b) as being anticipated by JP 11-328690 to Doi (hereinafter "Doi"). The rejection is respectfully traversed.

It is respectfully submitted that Doi fails to disclose or suggest a recording and/or reproducing method, the method comprising holding a result of the comparison for a predetermined period of time to generate a header field signal, as recited in claim 1.

Doi also fails to disclose or suggest a recording and/or reproducing apparatus, comprising a holding unit to hold the comparison signal to generate a header field signal for a servo driving unit..., as recited in claim 8.

Doi also fails to disclose or suggest a method of controlling a servo in an optical recording and/or reproducing apparatus, the method comprising comparing the signal representing the presence of a header field with a reference level and holding the comparison result for a predetermined period of time to generate a header field signal, as recited in claim 15.

Doi also fails to disclose or suggest an apparatus for controlling a servo in an optical recording and/or reproducing apparatus, the apparatus comprising a header field signal detecting circuit to compare a signal, from a pickup detecting light reflecting off a recording medium and including a signal representing the presence of a header field, with a reference level, and to hold the comparison result for a predetermined period of time to generate a header field signal, as recited in claim 21.

Doi fails to disclose holding the comparison result or signal to generate a header field signal because Doi lacks a structure to perform the function. Figure 10 of Doi discloses the details of a header part detection circuit 33 used to generate a header part detection signal (see for example, FIG. 10 and Abstract of Doi). As shown in Doi, the header part detection circuit 33 includes a number of comparators 43a-43d, a number of mono-multivibrators 44a-44d, and a number of logic gates. As shown in Doi, it appears a tracking signal is first input into Doi's

header part detection circuit 33, and compared with some reference values in the comparators 43a-43d. Then, the outputs of the comparators 43a-43d are made to trigger mono-multivibrators 44a-44d, and the outputs of the mono-multivibrators 44a-44d are passed through several logic gates to produce a final header part detection signal (see for example, FIG. 10 of Doi, and paragraph [0077] of a machine translation of Doi's Detailed Description section obtained from the Japanese Patent Office, which is attached). As multivibrators, once triggered, the mono-multivibrators 44a-44d of Doi would be unstable and not hold the comparison result or signal to generate a header field signal, as variously claimed in claims 1, 8, 15 and 21.

In contrast to Doi, Applicants disclose a sample and hold unit that holds the output of the OR gate to output the header field signal (see, for example, FIGS. 4 and 5A-5D and paragraph [0025] of the Applicants' Specification). Accordingly, Doi does not disclose or suggest holding the comparison result or signal to generate a header field signal, as variously recited in claims 1, 8, 15 and 21.

Therefore, claims 1, 8, 15 and 21 are patentable over Doi. Claims 2, 3, 7 and 27, which depend from claim 1, claims 9, 10, 14 and 31, which depend from claim 8, claims 16 and 28, which depend from 15, and claims 22 and 32, which depend from claim 21, are likewise patentable over the applied reference to Doi for at least the reasons discussed above and for the additional features they recite. Withdrawal of the rejection is respectfully requested.

NEW CLAIM:

New claims 35-38 are also patentable over the applied reference to Doi for at least their dependence from their respective independent claims, and for their additional features.

ALLOWABLE SUBJECT MATTER:

Claims 4-6 and 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

STEIN, MCEWEN & BUI, LLP

Date: 10/2/2006

By: _____
Seth S. Kim
Registration No. 54,577

1400 Eye St., NW
Suite 300
Washington, D.C. 20005
Telephone: (202) 216-9505
Facsimile: (202) 216-9510

Attachment: A machine translation of the Detailed Description Section of JP 11-328690 to Doi obtained from the Japanese Patent Office.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the optical disk unit with which a tracking servo and a focus servo are performed to optical disks, such as DVD-RAM.
[0002]
[Description of the Prior Art] Recently, DVD-RAM is developed as an optical disk. In the case of such a DVD-RAM, the header unit is preformatted into the sector unit which a land and a groove change for every (alternation) truck of 1 round, and exist in this one truck. This header unit shifts in the direction which crosses to the direction of a truck, and is prepared alternately. [two or more]
[0003] For example, it consists of four parts, and becomes two parts from two parts in the second half in the first half, the contents corresponding to the land as a truck with which two parts continue in the first half are recorded, and the contents to which two parts are equivalent to the groove as a truck contiguous to the truck are recorded in the second half.
[0004] Conventionally, the change of tracking and a focus servo is performed using the detection timing of a header unit. However, when a header unit detection signal becomes what **ed signal level and was mistaken with the ** noise, there is a fault that stable tracking and a focus servo cannot be performed, by the change of the mistaken servo.
[0005]
[Problem(s) to be Solved by the Invention] When a header unit detection signal becomes what **ed signal level and was mistaken with the ** noise, this invention by the change of a servo [made / in according to this header unit detection signal / the mistake] The fault that stable tracking and a focus servo cannot be performed is removed. A header unit detection signal can be prevented from becoming what **ed signal level and was mistaken with the ** noise, and it aims at offering the optical disk unit which can perform stable tracking and a focus servo using this header unit detection signal.
[0006]
[Means for Solving the Problem] The optical disk unit of this invention has the recording track of the groove which records the shape of a swirl, and concentric circular data, and a land. It has two or more record sections which consist of a header unit which consists of the groove and land of fixed length, and consists of address data, and a data area where data are recorded. In what reproduces the data which record data to the optical disk with which the address of the above-mentioned header unit is formed in the object for grooves, and lands by turns, or are recorded on the optical disk A condensing means to make light condense on the above-mentioned optical disk, and a detection means by which the light from the above-mentioned optical disk is detected, The tracking signal over the truck of the above-mentioned optical disk based on the detecting signal from a migration means to move the above-mentioned condensing means in the direction which intersects perpendicularly with the optical axis, and the above-mentioned detection means is used. The 1st output means which outputs the header unit detection signal which it corresponded before and after including the above-mentioned header unit, and it **ed signal level, and removed the ** noise, Based on the header unit

detection signal from the output means of the above 1st, the tracking signal over the truck of the above-mentioned optical disk a sample / by holding It consists of the above-mentioned header unit, the 2nd output means which outputs the tracking signal which removed the part to which that order corresponds, and a control means which performs migration control of the above-mentioned condensing means with the above-mentioned migration means with the tracking signal outputted by this 2nd output means.

[0007] The optical disk unit of this invention has the recording track of the groove which records the shape of a swirl, and concentric circular data, and a land. It has two or more record sections which consist of a header unit which consists of the groove and land of fixed length, and consists of address data, and a data area where data are recorded. In what reproduces the data which record data to the optical disk with which the address of the above-mentioned header unit is formed in the object for grooves, and lands by turns, or are recorded on the optical disk A condensing means to make light condense on the above-mentioned optical disk, and a detection means by which the light from the above-mentioned optical disk is detected, The 1st low pass filter which removes the high region signal of the tracking signal over the truck of the above-mentioned optical disk based on the detecting signal from a migration means to move the above-mentioned condensing means in the direction which intersects perpendicularly with the optical axis, and the above-mentioned detection means, and is delayed, The 2nd low pass filter from which the high region signal of the tracking signal over the truck of the above-mentioned optical disk based on the detecting signal from the above-mentioned detection means is removed, The 1st binary-ized circuit which makes binary the tracking signal over the truck of the above-mentioned optical disk based on the signal from this 2nd low pass filter, The 1st delay circuit delayed in the binary-ized output from this 1st binary-ized circuit, The high-pass filter from which the low-pass signal of the tracking signal over the truck of the above-mentioned optical disk based on the detecting signal from the above-mentioned detection means is removed, The 2nd binary-ized circuit which makes binary the tracking signal over the truck of the above-mentioned optical disk based on the signal from this high-pass filter, The 2nd delay circuit delayed in the binary-ized output from this 2nd binary-ized circuit, The AND circuit which outputs the AND of the output of the 1st delay circuit of the above, and the output of the 2nd delay circuit, Based on the output from this AND circuit, the output signal from the 1st low pass filter of the above is consisted of a sample / the sample/hold circuit to hold, and a control means which performs migration control of the above-mentioned condensing means with the above-mentioned migration means with the output from this sample/hold circuit.

[0008] The optical disk unit of this invention has the recording track of the groove which records the shape of a swirl, and concentric circular data, and a land. It has two or more record sections which consist of a header unit which consists of the groove and land of fixed length, and consists of address data, and a data area where data are recorded. In what reproduces the data which record data to the optical disk with which the address of the above-mentioned header unit is formed in the object for grooves, and lands by turns, or are recorded on the optical disk A condensing means to make light condense on the above-mentioned optical disk, and a detection means by which the light from the above-mentioned optical disk is detected, The focusing signal over the above-mentioned optical disk based on the detecting signal from a migration means to move the above-mentioned condensing means in the direction of an optical axis, and the above-mentioned detection means is used. The 1st output means which outputs the header unit detection signal which it corresponded before and after including the above-mentioned header unit, and it **ed signal level, and removed the ** noise, Except for the period when a header unit detection signal is supplied by the output means of the above 1st, the focusing signal over the above-mentioned optical disk based on the detecting signal from the above-mentioned detection means a sample / by holding It consists of the above-mentioned header unit, the 2nd output means which outputs the focusing signal which removed the part to which that order corresponds, and a control means which performs migration control of the above-mentioned condensing means with the above-mentioned migration means with the focusing signal outputted by this 2nd output means.

[0009] The optical disk unit of this invention has the recording track of the groove which records the shape of a swirl, and concentric circular data, and a land. It has two or more record sections which consist of a header unit which consists of the groove and land of fixed length, and consists of address data, and a data area where data are recorded. In what reproduces the data which record data to the optical disk with which the address of the above-mentioned header unit is formed in the object for grooves, and lands by turns, or are recorded on the optical disk A condensing means to make light condense on the above-mentioned optical disk, and a detection means by which the light from the above-mentioned optical disk is detected, A migration means to move the above-mentioned condensing means in the direction of an optical axis, and the 1st low pass filter which removes the high region signal of the focusing signal of the above-mentioned optical disk based on the detecting signal from the above-mentioned detection means, and is delayed, The 2nd low pass filter from which the high region signal of the focusing signal of the above-mentioned optical disk based on the detecting signal from the above-mentioned detection means is removed, The 1st binary-ized circuit which makes binary the focusing signal of the above-mentioned optical disk based on the signal from this 2nd low pass filter, The 1st delay circuit delayed in the binary-ized output from this 1st binary-ized circuit, The high-pass filter from which the low-pass signal of the focusing signal of the above-mentioned optical disk based on the detecting signal from the above-mentioned detection means is removed, The 2nd binary-ized circuit which makes binary the focusing signal of the above-mentioned optical disk based on the signal from this high-pass filter, The 2nd delay circuit delayed in the binary-ized output from this 2nd binary-ized circuit, The AND circuit which outputs the AND of the output of the 1st delay circuit of the above, and the output of the 2nd delay circuit, Based on the output from this AND circuit, the output signal from the 1st low pass filter of the above is consisted of a sample / the sample/hold circuit to hold, and a control means which performs migration control of the above-mentioned condensing means with the above-mentioned migration means with the output from this sample/hold circuit.

[0010]

[Embodiment of the Invention] Hereafter, with reference to a drawing, the optical disk unit of the operation gestalt of this invention is explained. Drawing 1 shows an optical disk unit. This optical disk unit reproduces data from record and this optical disk 1 of the data to an optical disk (DVD-RAM) 1.

[0011] Read-out of data is possible for this optical disk unit also not only from DVD-RAM but other DVD disks and CD disks, and it is constituted to the rewritable DVD disk as equipment which can write in data.

[0012] Therefore, the optical pickup 2 has the objective lens 3 for DVD, and the objective lens 4 for CD. In an optical pickup 2, corresponding to the objective lens 3 for DVD, and the objective lens 4 for CD, the object for DVD and the semiconductor laser unit for CD (not shown) are prepared, the optical disk 1 with which it was loaded responds for whether being a DVD disk or CD disk, one side of this semiconductor laser unit is chosen, it is energized with the laser control unit 5, and the laser beam of wavelength which corresponds, respectively is generated. If either the object for DVD and the semiconductor laser unit for CD are chosen and energized, the laser beam corresponding to an optical disk 1 will be turned to the matched-pairs object lenses 3 and 4, and it will converge it on an optical disk 1 with these objective lenses 3 and 4. Data are written in an optical disk 1 by this laser beam that it converged, or it is reproduced.

[0013] As for the laser control units 5, although the setup is set with the DVD data processing unit 6, the setup differs in CD mode in which data processing to the DVD mode and CD disk which perform data processing to a DVD disk in the washout mode list which eliminates the playback mode which acquires a regenerative signal, the recording mode which records data, and data is performed. That is, in DVD mode, the semiconductor laser unit for DVD is chosen, and it is energized, and the semiconductor laser unit for CD is chosen and energized in CD mode. The laser beam for the object for DVD or CD has the power of level which is different in the three modes, a playback mode, a recording mode, and washout mode, respectively, and a semiconductor laser unit is energized with the laser control unit 5 so that the laser beam of the power corresponding to the mode may be

generated.
[0014] This DVD disk or CD disk is contained by direct or disk cartridge 1a, and is conveyed in equipment on a tray 7 so that the objective lens 3 for DVD and the objective lens 4 for CD may be countered and the DVD disk 1 or CD disk may be arranged. The tray motor 8 for driving this tray 7 is formed in equipment. Moreover, the DVD disk 1 or CD disk with which it was loaded is held by La Stampa 9 on a spindle motor 10 pivotable, and rotates by this spindle motor 10. An optical pickup 2 is laid on the delivery device (not shown) driven by the delivery motor 11, and is moved to radial [of an optical disk 1] by this delivery device.
[0015] The optical pickup 2 has the photodetector (not shown) which detects a laser beam to the inside of it. This photodetector has detected the laser beam which was reflected with the optical disk 1 and returned through objective lenses 3 and 4. The detecting signal (current signal) from a photodetector is changed into a voltage signal by the current / electrical-potential-difference converter (I/V) 12, and this signal is supplied to the reference amplifier 13 and servo amplifier 14. From the reference amplifier 13, the regenerative signal as an addition signal is outputted to the DVD data processing unit 6. The servo signal from servo amplifier 14 is outputted to the DVD servo seeking control unit 15 in DVD mode, and is outputted to the CD data processing unit 16 in CD mode at CD servo seeking control list.
[0016] As an approach of detecting the amount of focal gaps optically, there is the following, for example.
[Astigmatism method] It is the approach of detecting form status change-ization of the laser beam which the optical element (not shown) which makes the detection optical path of a laser beam reflected with the light reflex film or light reflex nature record film of an optical disk 1 generating astigmatism is arranged, and is irradiated on a photodetector. The photodetection field is quadrisected in the shape of the diagonal line. To the detecting signal obtained from each detection field, the difference between the diagonal sums is taken within the DVD servo seeking control unit 15, and a focal error detection signal (focal signal) is acquired.
[0017] The [knife-edge method] It is the approach of arranging knife edge which shades a part asymmetrically to the laser beam reflected with the optical disk 1. Two ****s of photodetection fields are carried out, they take the difference between the detecting signals obtained from each detection field, and acquire a focal error detection signal.
[0018] Usually, either the describing [above] astigmatism method or the knife-edge method is ******(ed). An optical disk 1 has the shape of a spiral, and a concentric circular truck, and information is recorded on a truck. A condensing spot is made to trace along this truck, and informational playback, or record/elimination is performed. In order to be stabilized and to make a condensing spot trace along a truck, it is necessary to detect a relative location gap of a truck and a condensing spot optically.
[0019] Generally as the truck gap detection approach, the following approach is used. [-- phase contrast detection (Differential Phase Detection) -- law --] The intensity-distribution change on the photodetector of the laser beam reflected with the light reflex film or light reflex nature record film of an optical disk 201 is detected. The photodetection field is quadrisected on the diagonal line. To the detecting signal obtained from each detection field, the difference between the diagonal sums is taken within the DVD servo seeking control unit 15, and a truck error detection signal (tracking signal) is acquired.
[0020] [push pull (Push-Pull) -- law --] The intensity-distribution change on the photodetector of the laser beam reflected with the optical disk 1 is detected. Two ****s of photodetection fields are carried out, they take the difference between the detecting signals obtained from each detection field, and acquire a truck error detection signal.
[0021] [-- a twin spot (Twin-Spot) -- law --] A diffraction component etc. is arranged in the light transmission system between a semiconductor laser component and an optical disk 1, wavefront splitting of the light is carried out to plurality, and the amount change of reflected lights of the primary [**] diffracted light which irradiates on an optical disk 1 is detected. The photodetection field which

detects the amount of reflected lights of the +primary diffracted light and the amount of reflected lights of the -primary diffracted light separately apart from the photodetection field for regenerative-signal detection is arranged, the difference of each detecting signal is taken, and a truck error detection signal is acquired.

[0022] In DVD mode, a focal signal, a tracking signal, and a delivery signal are sent to a focus and a tracking actuator driver list from the DVD servo seeking control unit 15 at delivery Motor Driver 17, and objective lenses 3 and 4 are carried out by this driver 17 focal servo control, and it is carried out tracking servo control. Furthermore, according to an access signal, an energization signal is supplied to the delivery motor 11 from a driver 17, and the transfer control of the optical pickup 2 is carried out. This DVD servo seeking control unit 15 is controlled by the DVD data processing unit 6. For example, an access signal is supplied to the DVD servo seeking control unit 15 from the DVD data processing unit 6, and a delivery signal is generated. Moreover, the spindle motor driver 18 and the tray motor driver 19 are controlled by the control signal from the DVD data processing unit 6, a spindle motor 10 and the tray motor 8 will be energized, a spindle motor 10 will rotate at a predetermined rotational frequency, and the tray motor 8 will control a tray appropriately. Data required for RAM20 are stored, the regenerative signal supplied to the DVD data processing unit 6 is supplied to the SCSI interface control list which a regenerative signal is processed with this DVD data processing unit 6, and has RAM21 as a buffer at the CD-ROM decoder 22, and a regeneration signal is supplied to other equipments, for example, a personal computer, through SCSI.

[0023] In CD mode, a focal signal, a tracking signal, and a delivery signal are sent to CD servo seeking control list from the CD data processing unit 16 at delivery Motor Driver 17 at a focus and a tracking actuator driver list, and objective lenses 3 and 4 are carried out by this driver 17 focal servo control, and it is carried out tracking servo control. Furthermore, according to an access signal, an energization signal is supplied to the delivery motor 11 from a driver 17, and the transfer control of the optical pickup 2 is carried out. The spindle motor driver 18 and the tray motor driver 19 will be controlled by the control signal from the CD data processing unit 16 by this CD servo seeking control list, a spindle motor 10 will be energized, and a spindle motor 10 will rotate at a predetermined rotational frequency. The regenerative signal supplied to the CD data processing unit 16 is processed in this processing unit 16, and is outputted through CD data output amplifier 23.

[0024] Each part shown in drawing 1 is controlled by CPU25 according to the procedure stored in ROM24. RAM26 is used as memory of CPU25. Next, the structure of the optical disk 1 of DVD-RAM by which creation was carried out [above-mentioned] is explained.

[0025] The above-mentioned optical disk 1 consists of the sheets and adhesives for the record film of the disc-like substrate which consists of transparence resin, such as a polycarbonate with a thickness of 0.6mm or an acrylic, and a phase change form, the reflective film, a protective coat, and lamination. A slot and header information are recorded on a transparence substrate by the shape of toothing, and after forming record film etc. in a concave convex, concave convexes are considered as the configuration in which record playback is possible in lamination and both sides.

[0026] The above-mentioned optical disk 1 consists of header units 51 which consist of a PURIPITTO (embossing pit) train which shows beforehand a groove by which the wobble is carried out, a track address, etc. for tracking, as shown in drawing 2 and drawing 3 .

[0027] That is, in order to acquire the signal used as the criteria at the time of data logging, the wobble of the groove for tracking is carried out a fixed period. the phase of the signal which carries out the wobble of the groove for tracking to a header unit 51 a fixed period at this time -- outline **** -- it is made like.

[0028] The wobble of the header unit 51 is carried out outside first, and then it carries out a wobble inside, and the wobble also of the wobble of the groove for tracking is carried out outside first, and then it carries out a wobble inside.

[0029] As the above-mentioned optical disk 1 is shown in drawing 4 and drawing 5 , it consists of zone 43a of the embossing data zone 45 of the lead-in groove area 42, the rewritable data zone 46, and a data area 43, --43x, and a data zone of the lead-out area 44 sequentially from the inside, and

the clock signal over each zone is the same, and the rotational frequency (rate) of an optical disk 1 and the number of sectors of every one truck to each zone have become a thing different, respectively.

[0030] The lead-in groove area 42 consists of a rewritable data zone 46 which consists of an embossing data zone 45 which consists of a truck of plurality (1896), and two or more trucks. The embossing data zone 45 consists of a blank zone, a reference signal zone, a blank zone, a CDC zone, and a blank zone. A reference signal and CDC are recorded on the embossing data zone 45 at the time of manufacture. The rewritable data zone 46 is constituted by the zone for guard trucks, the zone for a disk test, the zone for a drive test, the zone for disk discernment data, and the shift management zone as shift management area.

[0031] The data area 43 is constituted by the plurality, for example, zone 43a of 24, which becomes radial from the truck of plurality (1888), and --43x. However, only zone 43a is 1888 trucks including the rewritable data zone 46.

[0032] The lead-out area 44 consists of a truck of plurality (1446), like the data zone 46 in which the above-mentioned rewriting is possible, is a rewritable data zone and can record now the same thing as the contents of record of the data zone 46.

[0033] In zone 43a of a data area 43, --43x, according to going to a periphery side from the inner circumference side of an optical disk 1, a rotational frequency (39.78-16.91Hz in rate) becomes late, and the number of sectors of every one truck (17-40) increases.

[0034] As shown in zone 43a of the above-mentioned data area 43, and the truck of --43x at drawing 4 and drawing 5 , data are recorded on every [as a unit of record of data] ECC (error correction code) block data unit (for example, 38688 bytes).

[0035] An ECC block consists of 16 sectors on which 2 K bytes of data are recorded. The sectors ID (discernment data)1-ID16 of the 4-byte (32 bits) configuration as address data are given to the Maine data (sector data) for every sector with the error detection code (IED:ID error detection code) of a 2-byte configuration. ECC (error correction code)1 of the longitudinal direction as an error correction code for reproducing the data recorded on an ECC block and ECC2 of a lengthwise direction are recorded. This ECC 1 and 2 is an error correction code given to data as a redundancy word, in order to prevent that it becomes impossible to reproduce data according to the defect of an optical disk 1.

[0036] While each sector is constituted from 172 bytes by data of 12 lines and ECC1 of the longitudinal direction of a 10-byte configuration is given to each line (Rhine) of every, ECC2 of the lengthwise direction for one line of a 182-byte configuration is given. Thereby, the error correction circuit 92 mentioned later performs error correction processing for every train using ECC2 of a lengthwise direction while performing error correction processing for every Rhine using lateral ECC1.

[0037] In case the above-mentioned ECC block is recorded on an optical disk 1, and data are reproduced for every (every predetermined data die-length spacing, 91 bytes: every 1456-channel bit) predetermined amount of data of each sector, the synchronous code (2 bytes : 32 channel bit) for taking a cutting tool synchronization is given.

[0038] Each sector consists of 26 the 0th frame to frame [25th] frames, and consists of a specific code (1 byte : 16 channel bit) for the synchronous code (frame alignment signal) given for every frame to specify a frame number, and a common code (1 byte : 16 channel bit) common to each frame.

[0039] As shown in zone 43a of the above-mentioned data area 43, and the truck of --43x at drawing 3 and drawing 4 , PURIFO matching of the header unit 51 and -- on which the address etc. is recorded, respectively is beforehand carried out for every sector.

[0040] The above-mentioned header unit 51 is formed at the time of formation of a groove. As this header unit 51 is shown in drawing 6 and drawing 7 , it is constituted by two or more header fields 52 which consist of two or more pits, and to the groove 53, as shown in drawing, it is preformatted, and the core of a pit exists in the location on the same line of the core of the amplitude of the boundary line of a groove 53 and a land 54. Drawing 6 is the header unit 51 given to the sector of the head of each truck, and drawing 7 is the header unit 51 given to the sector in the middle of each truck.

[0041] In this case, the header unit for grooves and the header unit for lands are formed by turns (alternate). The format for above-mentioned every sector is shown in drawing 8 .
[0042] In drawing 8 , 1 sector consists of 2697 bytes (bytes), and consists of record sections 58 of 57 or 2567 bytes of mirror field of 51 or 2 bytes of header field [128 bytes of] (it corresponds to a header unit 51).
[0043] The channel bit recorded on the above-mentioned sector is a 16-bit channel bit about 8-bit data in the format by which the 8-16 code modulation was carried out. In case the header field 51 manufactures an optical disk 1, it is area where predetermined data are recorded. This header field 51 is constituted by four header 1 fields, header 2 field, header 3 field, and header 4 field.
[0044] Header 1 field - header 4 field consists of 46 bytes or 18 bytes, and is constituted by 36 bytes or 8 bytes of synchronous code section VFO (Variable Frequency Oscillator), 3 bytes of address mark AM (Address Mark), 4 bytes of address part PID (Position Identifier), 2 bytes of error detection code IED (ID Error Detection Code), and 1 byte of postamble PA (Postambles).
[0045] Header 1 field and header 3 field have 36 bytes of synchronous code section VFO1, and the header field 2 and header 4 field have 8 bytes of synchronous code section VFO2.
[0046] The synchronous code section 1 and VFO 2 is a field for drawing PLL, the synchronous code section VFO1 carries out "36" cutting-tool (it is 576 bits in channel bit) part record (the pattern of fixed spacing is recorded) of the continuation of "010 --" in a channel bit, and the synchronous code section VFO2 records continuation of "010 --" in a channel bit by "8" cutting tools (it is 128 bits in a channel bit).
[0047] The address mark AM is the synchronous code of "3" cutting tools who show where a sector address begins from. The special pattern not appearing is used for the part for the data division [pattern / of each cutting tool of this address mark AM], "0100100000000100."
[0048] Address part PID 1-4 is a field where the sector address (an ID number is included) as 4 bytes of address information is recorded. A sector address is a physical sector number as a physical address which shows the physical location on a truck, and since it is recorded at a mastering process, this physical sector number can be rewritten no longer.
[0049] In the case of PID1, it is "1", and an ID number is a number showing a number of [the / of the inside which is carrying out overwrite 4 times by one header unit 51]. The error detection code IED is an error (error) detection sign to a sector address (ID number ****), and can detect the existence of the error in read PID.
[0050] Postamble PA includes the State information required for a recovery, and it also has the role of polar adjustment so that a header unit 51 may be completed in a tooth space. The mirror field 57 is used for offset amendment of a tracking error signal, timing generating of a land / groove change signal, etc.
[0051] a record section -- 58 -- ten - 26 -- a byte -- a gap -- a field -- 20 - 26 -- a guard -- one -- a field -- 35 -- a byte -- VFO -- three -- a field -- three -- a byte -- pre - synchronous one -- a code -- (-- PS --) -- a field -- 2418 -- a byte -- a data area -- one -- a byte -- a postamble -- three (PA3) -- a field -- 48 - 55 -- a byte -- a guard -- two -- a field -- and -- nine - 25 -- a byte -- a buffer area -- constituting -- having -- **** .
[0052] This record section 58 consists of fields which carry out a wobble to field 58a which is prepared in the head, and which does not carry out a wobble in the predetermined amount of wobble amplitude based on the predetermined frequency prepared following this field.
[0053] A gap field is a field which writes nothing. Guard 1 field is a field prepared in order to make it termination degradation at the time of repeat record peculiar to a phase change record medium not reach even VFO3 field.
[0054] Although VFO3 field is also a field for a PLL lock, it is the field which also makes it the purpose to insert a synchronous code into the same pattern and to take the synchronization of the byte boundary. PS (pre-synchronous code) field is a field for the alignment for tying to a data area.
[0055] A data area is a field which consists of Data ID, data ID error correction code IED (Data ID Error Detection Code), a synchronous code, ECC (Error Correction Code) and EDC (Error Detection

Code), user data, etc. Data ID are the sectors ID1-ID16 of the 4-byte (32-channel bit) configuration of each sector. The data ID error correction code IED is an error correction code of the 2-byte (16 bits) configuration for data ID.

[0056] The above-mentioned sector ID (1-16) consists of sector information on 1 byte (8 bits), and a sector number (logical sector number as the logical address which shows the logical location on a truck) of 3 bytes. Sector information is constituted by a 1 bit sector-format type field, the 1 bit tracking approach field, a 1 bit reflection factor field, the 1 bit reserve field, the 2 bits area type field, the 1-bit data-type field, and the 1-bit layer number field.

[0057] A logical sector number becomes a different thing from a physical sector number by slip shift processing by the initial defect. PA(postamble) 3 field includes the State information required for a recovery, and is a field which shows the conclusion of the last byte of a front data area.

[0058] Guard 2 field is a field prepared in order to make it termination degradation at the time of repeat record peculiar to a phase change record medium not reach even a data area. A buffer area is a field prepared in order to absorb rotation fluctuation of the motor turning around an optical disk 1 etc. so that a data area may not start the following header unit 51.

[0059] The gap field is the expression of 10+J / 16 bytes because it performs a random shift. A random shift is shifting the location [begin] which data's write in order to ease repeat record degradation of a phase change record medium. The die length of a random shift is adjusted by the die length of the buffer area located in the tail end of a data area, and the die length of the one whole sector is fixed 2697 bytes.

[0060] As mentioned above, respectively, the spare sector is prepared for zone 43a of the above-mentioned data area 43, --43x, and it is used in the same zone as a final spare at the time of performing slip shift processing (slipping replacement algorithm) of a sector unit.

[0061] Next, in the above-mentioned DVD servo seeking control unit 15, the tracking control circuit 30 as shown in drawing 9 is formed. The above-mentioned tracking control circuit 30 outputs the tracking signal which removed the part to a header unit 51 from the tracking signal (truck king error signal) generated by the signal from the above-mentioned servo amplifier 14.

[0062] The above-mentioned tracking control circuit 30 is constituted by the low pass filter 31, the sample/hold circuit 32, and the header unit detecting circuit 33 as shown in drawing 9 .

[0063] A low pass filter 31 is constituted by a capacitor C1, resistance R1, and operational amplifier 31a. A sample / hold circuit 32 It is constituted by circuit-changing-switch 32a, a capacitor C2, resistance R2, and A/D converter 32b. The header unit detecting circuit 33 A low pass filter 41, a high-pass filter 42, resistance R3, R4, R5, R6, R7, R8, R9, and R10, comparator 43a, It is constituted by 43b, 43c, 43d, the mono-multivibrators 44a, 44b, 44c, and 44d, OR circuits 45 and 46, and AND circuits 47 and 48.

[0064] A window comparator is constituted by the above-mentioned low pass filter 41, a high-pass filter 42, resistance R3, R4, R5, R6, R7, R8, R9, and R10, and Comparators 43a, 43b, 43c, and 43d, and the delay circuit 34 is constituted by the mono-multivibrators 44a, 44b, 44c, and 44d.

[0065] A low pass filter 31 outputs the signal which removed the higher harmonic and was delayed from the tracking signal as shown in (a) of drawing 11 . When the signal of the header unit in the tracking signal by the low pass filter 31 is delayed, it can have the change location of a sample/hold to the front than the front end of a header unit.

[0066] A low pass filter 41 outputs a signal as shown in (d) of drawing 11 which removed the high frequency component from the tracking signal as shown in (a) of drawing 11 . A high-pass filter 42 outputs the signal which it **ed, a tracking signal to a low-frequency component, i.e., a signal, and removed the loose fluctuation by the ** noise.

[0067] It **s a tracking signal with a low pass filter 41, and Comparators [43a, 43b, 43c, and 43d] reference voltage follows the loose fluctuation by the ** noise, and is changed.

[0068] Mono-multivibrator 44a outputs a signal as shows the binary-ized output made binary with the slice level by the side of plus by comparator 43a from the tracking signal as shown in (a) of drawing 11 , and (a) of drawing 12 to (b) of delayed drawing 11 , and (b) of drawing 12 .

[0069] Mono-multivibrator 44b outputs a signal as shows the binary-ized output made binary with the slice level by the side of minus by comparator 43b from the tracking signal as shown in (a) of drawing 11 , and (a) of drawing 12 to (c) of delayed drawing 11 , and (c) of drawing 12 .
[0070] Mono-multivibrator 44c outputs the signal delayed from the tracking signal as shown in (e) of drawing 11 , and (d) of drawing 12 in the binary-ized output made binary with the slice level by the side of plus by comparator 43c.
[0071] Mono-multivibrator 44d, the signal delayed from the tracking signal as shown in (e) of drawing 11 and (d) of drawing 12 in the binary-ized output made binary with the slice level by the side of minus by comparator 43d is outputted.
[0072] OR circuit 45 takes the OR of a mono-multivibrators [44c and 44d] output, and outputs a signal as shown in (f) of drawing 11 , and (e) of drawing 12 . That is, the mask signal over a header unit 51 is outputted.
[0073] AND circuit 47 outputs the header unit detection signal over the part to the first portion of the header unit 51 within the above-mentioned tracking signal by taking ANDO of the output of mono-multivibrator 44a, and OR circuit 45.
[0074] AND circuit 48 outputs the header unit detection signal over the part to the second half section of the header unit 51 within the above-mentioned tracking signal by taking ANDO of the output of mono-multivibrator 44b, and OR circuit 45.
[0075] OR circuit 46 outputs a header unit detection the whole header unit 51 as shown in (f) of drawing 11 signal by taking the OR of the output of AND circuits 47 and 48.
[0076] When a sample / hold circuit 32 has a high-level header unit detection signal from OR circuit 46 in the header unit detecting circuit 30, circuit-changing-switch 32a turns off, the tracking signal from a low pass filter 31 is intercepted, and in case the header unit detection signal from AND circuit 35 is a low level, circuit-changing-switch 32a turns on, the tracking signal from a low pass filter 31 is supplied to A/D converter 32b, and the tracking signal of digital value is outputted to a driver 17 from A/D converter32b.
[0077] Next, tracking actuation is explained in the above configurations. For example, now, when carrying out the tracking of the predetermined truck (a groove or land), a tracking signal as shown in (a) of drawing 11 with the DVD servo seeking control unit 15 with the output from a servo amplifier 14 is generated, and the low pass filter 31 in the tracking control circuit 30, the low pass filter 41 in the header unit detecting circuit 33, a high-pass filter 42, and Comparators 43a and 43b are supplied.
[0078] The signal which removed by this the higher harmonic of the part of the header unit outputted with a low pass filter 31, and was delayed is supplied to a sample / hold circuit 32. Moreover, in the header unit detecting circuit 33, the binary-ized output made binary from the tracking signal as shown in (a) of drawing 11 with the slice level by the side of plus (generated using the signal which removed the high frequency component from the tracking signal with the low pass filter 41) is outputted from comparator 43a, and mono-multivibrator 44a is supplied.
[0079] Moreover, in the header unit detecting circuit 33, the binary-ized output made binary from the tracking signal as shown in (a) of drawing 11 with the slice level by the side of minus (generated using the signal which removed the high frequency component from the tracking signal with the low pass filter 41) is outputted from comparator 43b, and mono-multivibrator 44b is supplied.
[0080] Thereby, mono-multivibrator 44a outputs the delay output which shows the high-level back end of the binary-ized output from comparator 43a to delayed (b) of drawing 11 to AND circuit 47, and mono-multivibrator 44b outputs the delay output which shows the high-level back end of the binary-ized output from comparator 43b to delayed (c) of drawing 11 to AND circuit 48.
[0081] Moreover, in the header unit detecting circuit 33, the binary-ized output made binary with the slice level by the side of plus (generated using the signal which removed the high frequency component from the tracking signal with the low pass filter 41) from the high-pass filter 42 as shown in (e) of drawing 11 is outputted from comparator 43c, and mono-multivibrator 44c is supplied.
[0082] Moreover, in the header unit detecting circuit 33, the binary-ized output made binary with the slice level by the side of minus (generated using the signal which removed the high frequency

component from the tracking signal with the low pass filter 41) from the high-pass filter 42 as shown in (e) of drawing 11 is outputted from comparator 43d, and mono-multivibrator 44d is supplied.
[0083] Thereby, mono-multivibrator 44c outputs the delay output delayed in the high-level back end of the binary-ized output from comparator 43c to AND circuit 47 through OR circuit 45, and mono-multivibrator 44b outputs the delay output delayed in the high-level back end of the binary-ized output from comparator 43b to AND circuit 48 through OR circuit 45.
[0084] Consequently, the OR of the output of above-mentioned AND circuits 47 and 48 is taken by OR circuit 46, this output serves as a header unit detection signal shown in (f) of drawing 11 which includes the part to the header unit 51 within the above-mentioned tracking signal, and it outputs to a sample / hold circuit 32.
[0085] That is, the fall section of the header unit detection signal which the start section of the header unit detection signal shown in (f) of this drawing 11 is fully this side, and shows to (f) of drawing 11 from the head part of the header unit of the tracking signal from a low pass filter 31 is the back more nearly enough [than the back end part of the header unit of the tracking signal from a low pass filter 31].
[0086] As shown in (a) of drawing 12 , except header unit 51 moreover, with record data It will be in the condition that a tracking signal exceeds slice level. Mono-multivibrator 44a, Even when a signal as shown in (b) of drawing 12 and (c) from 44b is outputted, the mono-multivibrators [44c and 44d] output, i.e., the output of an OR circuit, serves as - level, the output of AND circuits 47 and 48 serves as as [low level], and a header unit detection signal is not outputted.
[0087] Therefore, the mask of the tracking signal from the above-mentioned low pass filter 31 is carried out with the header unit detection signal supplied, a sample/hold is performed, this sample / hold output are changed into digital value by A/D converter 32b, and a sample / hold circuit 32 is outputted to a driver 17.
[0088] it described above -- as -- the case of the optical disk 1 of DVD-RAM -- the groove or land for tracking -- receiving -- about -- the header unit shifted in a part for 1/2 truck, inner circumference, and the direction of a periphery is beforehand recorded on the optical disk 1 by PURIPITTO (irregularity), and as shown in (a) of drawing 11 , the header signal is getting in the tracking signal. In this case, detection when coming to a header unit is performed at a high speed as a signal which detects a header unit, sufficient time lag for detection of the header unit having been completed is added, and it is made to detect.
[0089] In the place whose tracking signal before and behind a header unit is stable using this header unit detection signal, ON of the sample/hold to a tracking signal and the change of OFF can be performed.
[0090] That is, a tracking signal is performed, it detects having come to the header unit, a sample / in case it holds, a hold change is performed before the header unit of a tracking signal, and when [of header unit shift] time amount passes enough, it is made to switch to sample mode.
[0091] Thereby, to a tracking servo, a sample / hold actuation at a stable point are attained, and even if a header unit exists, stable tracking can be performed.
[0092] Furthermore, it **s signal level, a ** noise can be prevented from outputting a header Tomonobu number accidentally with playback data except a header unit, and a stable tracking servo can be performed using this header unit detection signal.
[0093] Although the above-mentioned operation gestalt explained the case where the signal of a header unit was removed from a tracking signal, it can carry out similarly about the case where the signal of a header unit is removed from a focusing signal, using drawing 11 from above-mentioned drawing 9 .
[0094] Therefore, ON of the sample/hold to a focusing signal and the change of OFF can be performed in the place whose focusing signal before and behind a header unit is stable using the above-mentioned header unit detection signal.
[0095] Thereby, to a focusing servo, a sample / hold actuation at a stable point are attained, and even if a header unit exists, stable focusing can be performed. Under the present circumstances, the

effect of the cross talk of a header unit etc. is removable.
[0096] Furthermore, it **s signal level, a ** noise can be prevented from outputting a header Tomonobu number accidentally with playback data except a header unit, and a stable focus servo can be performed using this header unit detection signal.
[0097] In said each example, although the sample/hold circuit was used, not only this but gain may be switched, and if a reference is fixed, it can carry out similarly.
[0098]
[Effect of the Invention] As explained in full detail above, according to this invention, a header unit detection signal can be prevented from becoming what **ed signal level and was mistaken with the ** noise, and the optical disk unit which can perform stable tracking and a focus servo using this header unit detection signal can be offered.

[Translation done.]